CMSC 256
Data Structures And Object Oriented Programming
Syllabus

Catalog listing: 2016 – 2017
Course Level: 200
Prerequisites: CMSC 255 with a grade of C; co-requisite: CMSC 302.
Instructor: Debra Duke
Office: Engineering East E2251
Phone: (804) 828-7135
Email: s2dmduke@vcu.edu
Classroom: Engineering East, Room E2214
Class website: Blackboard
Office Hours: Thursday 1:00 pm – 3:00 pm or by appointment

1.0 – Overview (Catalog Course Description):

Semester course; 3 lecture hours. 3 credits. Prerequisites: CMSC 255 with a grade of C; co-requisite: CMSC 302. Advanced programming using Java. Topics include introduction to object-oriented design, inheritance, polymorphism, exceptions, interfaces, linked lists, stacks, queues, binary trees, recursion, and basic searching and sorting techniques. Continued focus on program testing and UML notation.

2.0 – Course Structure:

Lecture hours/week – 3
Lab hours/week – 0

3.0 – Course Goals
At the end of the course, students should be able to:

1. Construct programs and sub-programs using multi-dimensional arrays that utilize file input/output for data.
2. Apply the object-oriented principles of abstraction, encapsulation, inheritance, interfaces, and polymorphism in program design.
3. Differentiate algorithms according to their relative efficiency by performing basic algorithm analysis of their respective running times.
4. Distinguish various data structures (arrays, sets, lists, stacks, queues, maps, and trees) according to their use, implementation, appropriateness, and efficiency.
5. Discuss the structure of a linked list (both singly and doubly linked) in terms of its uses, implementation details, appropriateness to the problem domain, and efficiency.
6. Examine the design, implementation, and efficiency of recursive algorithms in sub-programs.
7. Analyze linear and binary search algorithms along with various sorting algorithms (insertion sort, selection sort, Shell sort, merge sort, and quick sort).

4.0 – ABET Criteria Addressed:

a. An ability to apply knowledge of computing and mathematics appropriate to the program’s student outcomes and to the discipline.
b. An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.
c. An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.
d. An ability to use current techniques, skills, and tools necessary for computing practice.

5.0 – Major Topics Covered:

• Object-oriented programming
• Basic Data Structures
• Basic Algorithms

6.0 – Textbook(s):


7.0 – Class Schedule:

• Lecture: Monday/Wednesday 4:00 – 5:15pm, Temple Bldg., Room 1165

8.0 – Evaluation:

General Instructions:
1. All programming assignments must be uploaded to Blackboard on or before the due date specified.
2. No assignments will be accepted late unless special permission has been given prior to the due date.
3. No makeup exams will be given unless special permission has been given prior to the date of the test.
4. All programs are to be individual efforts. This does not preclude the discussion of techniques to be used or ideas for algorithms. In addition, it is permissible to help each other find syntax errors or minor logic errors.
However, the actual correction of such errors is up to the author of the program.

5. Personal computers/laptops may be used in class only with the instructor’s permission.

6. Do your own work. Plagiarism applies to source code as with any other intellectual property. Plagiarized code is a form of cheating and will be treated as such. Instances of plagiarism and other violations of the VCU Honor Code will be reported to the VCU Honor Council.

**Grading:**

<table>
<thead>
<tr>
<th>Category</th>
<th>% weight</th>
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</thead>
<tbody>
<tr>
<td>Homework and Quizzes</td>
<td>15</td>
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<tr>
<td>Programming Projects</td>
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<tr>
<td>Tests</td>
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<tr>
<td><strong>Final Exam</strong></td>
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**Grading scheme:**
- A: >= 90%
- B: >= 80% and < 90%
- C: >= 70% and < 80%
- D: >= 60% and < 70%
- F: < 60%

*Please consult external resources for VCU policies regarding academic honesty, students with disabilities, student conduct in the classroom, withdrawal from classes, and others.*